CLAIMS

What is claimed is:

1. A potato tuber, or a part of a tuber, of potato cultivar X17, wherein a representative sample of said tuber was deposited under ATCC Accession No. **PTA-122248**.

2. A potato plant, or a part thereof, produced by growing the tuber, or a part of the tuber, of claim 1.

3. A potato plant having one or more physiological and morphological characteristics of the plant of claim 2, and comprising the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

4. A tissue culture of cells produced from the plant of claim 2, wherein said cells of the tissue culture are produced from a plant part selected from the group consisting of leaf, pollen, embryo, cotyledon, hypocotyl, meristematic cell, root, root tip, pistil, anther, flowers, stem and tuber, and wherein said tissue cultured cells comprise the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

5. A potato plant regenerated from the tissue culture of claim 4, wherein said plant has one or more physiological and morphological characteristics of potato cultivar X17.

6. A potato seed produced by growing the potato tuber, or a part of the tuber, of claim 1, wherein said seed comprises the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

7. A potato plant, or a part thereof, produced by growing the seed of claim 6.

8. A potato plant regenerated from tissue culture of the potato plant of claim 7, wherein said regenerated plant comprises the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

9. A method for producing a potato seed, said method comprising crossing two potato plants and harvesting the resultant potato seed, wherein at least one potato plant is the potato plant of claim 2.

10. A method for producing a potato seed, said method comprising crossing two potato plants and harvesting the resultant potato seed, wherein at least one potato plant is the potato plant of claim 7.

11. A potato seed produced by the method of claim 10, wherein said seed comprises the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further

comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

12. A potato plant, or a part thereof, produced by growing said potato seed of claim 11.

13. A potato seed produced from the plant of claim 12, wherein said seed comprises the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

14. The method of claim 9, wherein one of said potato plants is potato cultivar X17 and the second potato plant is transgenic.

15. A method of producing a potato seed, said method comprising crossing two potato plants and harvesting the resultant potato seed, wherein one of said potato plants is the potato plant of claim 7 and the second potato plant is transgenic.

16. A potato plant, or a part thereof, produced by growing the seed produced by the method of claim 14, wherein said plant comprises the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

17. A method of introducing a desired trait into potato cultivar X17, wherein the method comprises:

    (a) crossing a X17 plant, wherein a representative sample of tubers was

deposited under ATCC Accession No. **PTA-122248**, with a plant of another potato cultivar that comprises a desired trait to produce progeny plants, wherein the desired trait is selected from the group consisting of male sterility, herbicide resistance, insect resistance, modified fatty acid metabolism, modified carbohydrate metabolism and resistance to bacterial disease, fungal disease or viral disease;

(b) selecting one or more progeny plants that have the desired trait;

(c) backcrossing the selected progeny plants with X17 plants to produce backcross progeny plants;

(d) selecting for backcross progeny plants that have the desired trait; and

(e) repeating steps (c) and (d) two or more times in succession to produce selected third or higher backcross progeny plants that comprise the desired trait.

18. A potato plant produced by the method of claim 17, wherein the plant has the desired trait and comprises the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

19. The potato plant of claim 18, wherein the desired trait is herbicide resistance and the resistance is conferred to an herbicide selected from the group consisting of imidazolinone, sulfonylurea, glyphosate, glufosinate, L-phosphinothricin, triazine and benzonitrile.

20. The potato plant of claim 18, wherein the desired trait is insect resistance and the insect resistance is conferred by a transgene encoding a *Bacillus thuringiensis* endotoxin.

21. The potato plant of claim 18, wherein the desired trait is modified fatty acid metabolism or modified carbohydrate metabolism and said desired trait is conferred by a nucleic acid encoding a protein selected from the group consisting of fructosyltransferase, levansucrase,

α-amylase, invertase and starch branching enzyme or DNA encoding an antisense of stearyl-ACP desaturase.

22. A method of producing a commodity plant product, comprising obtaining the plant of claim 2, or a part thereof, and producing the commodity plant product from said plant or plant part thereof, wherein said commodity plant product is selected from the group consisting of: fresh whole potatoes, French fries, potato chips, dehydrated potato material, potato flakes and potato granules.

23. The commodity plant product produced by the method of claim 22, wherein said product comprises the insert region of pSIM1278 that is present in cultivar X17 which contains inverted repeats of potato DNA effective for inhibition of expression of the endogenous asparagine synthetase-1 gene and the endogenous polyphenol oxidase-5 gene in addition to inverted repeats of the endogenous potato promoters for the phosphorylase-L and dikinase R1 genes and further comprising the insert region of pSIM1678 that is present in X17 which contains the potato late blight resistance gene *Rpi-vnt1* and inverted repeats of potato DNA effective for inhibition of expression of the endogenous vacuolar invertase gene *VInv*.

24. A food product made from the potato tuber of claim 1, wherein the food product is a sliced potato tuber food product.

25. A food product made from the potato tuber of claim 1, wherein the food product is a French fry or chip.

26. A heat-processed tuber product obtained from the potato tuber of claim 1.

27. A heat-processed tuber product obtained from the potato tuber of claim 1, wherein the heat processed tuber product is selected from the group consisting of: a French fry, a chip, and a baked potato.

28. A heat-processed tuber product obtained from the potato tuber of claim 1, wherein the heat processed tuber product is selected from the group consisting of: a French fry, a chip, and a baked potato, wherein the heat-processed tuber product has a concentration of acrylamide that is at least 50% lower, 60% lower, 70% lower, 80% lower, 85% lower, or more, than the concentration of acrylamide of a control heat-processed tuber product that is obtained from a

control potato plant that does not comprise the insert region of pSIM1278 and pSIM1678 that is present in cultivar X17.